PREFIX SEARCH CIRCUITRY AND METHOD

ABSTRACT OF THE DISCLOSURE

Prefix searches for directing internet data packets are performed in a prefix search integrated circuit. The integrated circuit includes an array of search engines, each of which accesses a prefix search tree data structure to process a prefix search. An SDRAM is dedicated to each search engine, and SDRAMs share address and control pins to plural search engines on the IC chip. Internal nodes of the tree data structure are duplicated across banks of the SDRAMs to increase bandwidth, and leaf nodes are stored across the SDRAM banks to reduce storage requirements. Within each search engine, data stored in a data register from an SDRAM is compared to a prefix search key stored in a key register. Based on that comparison, an address is calculated to access further tree structure data from the SDRAM. Packet descriptors containing search keys are forwarded to the search engines from an input queue and the search results are forwarded to an output queue, the same packet order being maintained in the two queues.